


Shaughnessy No: 111601

Date Out of EAB: APR 02 1986

To: Donal Stubbs  
Product Manager 41  
Registration Division (TS-767)

From: Samuel M. Creeger, Chief   
Environmental Chemistry Review Section 1  
Exposure Assessment Branch  
Hazard Evaluation Division TS-769c

Attached, please find the EAB review of:

Reg./File § : 86-WI-09

Chemical Name: Oxyfluorfen

Type Product : Herbicide

Product Name : Goal 1.6E (Rohm & Haas)

Company Name : State of Wisconsin

Purpose : Emergency exemption (Section 18) for use on horseradish.

Date In: 3/14/86

Action Code: 510

Date Completed: 4/1/86

EAB §(s) : 6412

Reviewing Time: 1.5 days

Deferrals to:

       Ecological Effects Branch

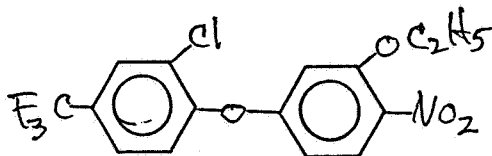
       Residue Chemistry Branch

       Toxicology Branch

Monitoring study requested by EAB: ☒

Monitoring study voluntarily conducted by registrant: ☐

①

1. CHEMICAL:Common Name- oxyfluorfenChemical Name- 2-chloro-1-(3-ethoxy-4-nitrophenoxy)-4-trifluoromethylbenzeneTrade Name- Goal 1.6EChemical Structure-2. TEST MATERIAL: Not applicable. No new data submitted.

3. STUDY/ACTION TYPE: The State of Wisconsin (Dept of Agriculture, Trade & Consumer Protection) is requesting a one-year Emergency Exemption (Section 18) to use Goal 1.6E on horseradish to control annual broadleaf weeds.

4. STUDY IDENTIFICATION: Not applicable.5. REVIEWED BY:

Herbert L. Manning, Ph.D.  
Microbiologist  
EAB/HED

Signature: *Herbert L. Manning*  
Date: *1 April 1986*

6. APPROVED BY:

Samuel M. Creeger  
Chief, Section 1  
EAB/HED

Signature: *Sam M Creeger*  
Date: *APR 02 1986*

7. CONCLUSION:

The emergency use of Goal (oxyfluorfen) is requested for the following reasons:

- (a) This formulation (Goal 1.6E) is currently registered for preemergence, post-emergence, or post-directed applications in fruit (almond, apricot, cherry, fig, nectarine, peach, pear, pistachio, plum, prune, walnut, and grapes), conifer seedbeds, transplants and container stock, corn, cotton, fallow ground, onion, spearmint and peppermint, and soybean.

- (b) The area to be treated will not exceed 575 acres.
- (c) Presently, weed control in horseradish fields in WI is mainly by mechanical means, and the rising costs of fuel and labor have made this method impractical, especially since the crop is cultivated about 11 times a year.
- (d) The currently registered pesticides are either used before crop emergence (Roundup) or is not as effective on higher organic soil and is mainly useful on annual grass weeds (Dacthal).
- (e) The application program will include at least 13 use restrictions of the herbicide (see p. 3 of supporting information).

A brief summary of the fate data in our files on oxyfluorfen is as follows:

- Hydrolysis- Oxyfluorfen is stable to hydrolysis at pH 4, 7, and 10 at 25°C and 45°C at 0.05 ppm. The study is acceptable. Review of 2-8-79, Acc. § 096884, Report § 34H-77-30.
- Photodegradation (water)- The study used too large a percent organic solvent (50%) and was judged unacceptable (2-8-79 review).
- Aerobic Soil Metabolism- A study using sandy loam and silty loam soils, sampled over 393 days, did not achieve the first half-life in this time period. The study did not adequately identify degradates (2-8-79 review, Acc. § 094336).
- Anaerobic Soil Metabolism- As part of aerobic study above, about 2-7% of applied herbicide degraded after 60 days.
- Leaching (unaged soil)- Four soils: silt loam, clay loam, sand, and sandy loam, were treated with radiolabeled oxyfluorfen and tested for leaching in soil columns. Oxyfluorfen did not leach below 4 inches in all soils except sand, where it was found (traces) at 9 inches. Study was acceptable (2-8-79 review, Acc. § 094336).
- Leaching (aged residues)- Sandy loam soil was tested in a soil column using radiolabeled oxyfluorfen. About 1.85% of ring-labeled chemical was found in leachate. More than 82% was in 0-2 inch segment. Study was acceptable (2-8-79 review, Acc. § 094336).
- Adsorption/Desorption- <sup>14</sup>C-labeled chemical used in treating 5 soils (sandy loam, clay, sand, silt loam, and loam). Oxyfluorfen was strongly adsorbed to all the soils. Adsorption constants (k) could only be calculated for clay (15.49) and sand (9.95). Desorption occurred in the reverse order of adsorption of oxyfluorfen to the soils. Study was acceptable (2-8-79 review, Acc. § 096884).
- Soil Field Dissipation- Five different soils were treated: silty loam (1), sandy loam (3), and clay loam (1). Samples taken down to 3 inches

gave half-lives ranging from 52.8 to 71.8 days. Study was unacceptable (2-8-79 review, Acc. § 096883).

- Rotational Crop- No acceptable study has been reviewed. However, a rotational crop restriction of 10-months for crops other than cotton, onions, soybeans, or spearmint/peppermint is part of the proposed program.
- Fish Accumulation- A flow-through study used bluegill sunfish exposed to radiolabeled oxyfluorfen. While bioconcentration factors were not calculated, there was bioaccumulation of oxyfluorfen (5.6 mg/kg in muscle), but the residues in the muscle, viscera, and whole fish at the end of the 14-day depuration period were less than the one-day exposure level (0.36 mg/kg in muscle). The study did not identify degradates (2-8-79 review, Acc. § 096886).

Potential for Groundwater Contamination: The soil column and adsorption leaching studies indicate a low potential that oxyfluorfen will leach to groundwater.

#### 8. RECOMMENDATIONS:

EAB does not have certain, acceptable environmental fate data in our files (aqueous photolysis, aerobic soil metabolism, soil field dissipation, and rotational crop) needed to support use of oxyfluorfen on horseradish.

#### 9. BACKGROUND:

##### A. Introduction

See Section 3 of this review.

##### B. Directions for Use

See attached proposed label and supporting information.

#### 10. DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

##### A. Study Identification

Not applicable. No new data submitted.

#### 11. COMPLETION OF ONE-LINER:

Not applicable. No new data submitted.

#### 12. CONFIDENTIAL APPENDIX:

No CBI was included in this submission.

MAR 4 1986

APPLICATION FOR EMERGENCY EXEMPTION FOR THE USE OF THE HERBICIDE  
GOAL 1.6E ON HORSERADISH IN WISCONSIN

This is an application for specific exemption under section 18 of FIFRA for the use of oxyfluorfen to control annual broadleaf weeds in Wisconsin during the 1986 growing season. The following information is submitted in the format indicated in the proposed rules for Chapter 1, Title 40 CFR, Part 166, Subchapter E:

A. General information required in an application for a specific exemption.

1. Identity of contact persons:

- (i) Technical questions regarding use of Goal 1.6E on horseradish should be addressed to:

Dr. Herbert J. Hopen  
University of Wisconsin-Madison  
Department of Horticulture  
1575 Linden Drive  
Madison, WI 53706  
(608)262-3988

- (ii) Questions regarding regulatory matters and the section 18 application should be addressed to:

Dr. Edward A. Bergman  
Wisconsin Department of Agriculture, Trade  
and Consumer Protection  
801 West Badger Road  
P.O. Box 8911  
Madison, WI 53708  
(608)267-9148

2. Description of the pesticide:

- (i) Goal 1.6E is a selective herbicide registered by Rohm & Haas Company (EPA Reg. No. 707-174), Philadelphia, Pennsylvania. It contains 19.4% oxyfluorfen (2-chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl) benzene, and 80.6% inert ingredients (see label in Appendix iii).

Goal 1.6E is presently registered for preemergence, post-emergence or post-directed applications in fruit (almond, apricot, cherry, fig, nectarine, peach, pear, pistachio, plum, prune, walnut, and grapes), conifer seedbeds, transplants and container stock, corn, cotton, fallow ground, onion, spearmint and peppermint, and soybean.

(ii) Proposed label for use of Goal 1.6E in horseradish in Wisconsin for the 1986 growing season:

FOR USE ONLY BY CERTIFIED PRIVATE APPLICATORS AND/OR LICENSED COMMERCIAL APPLICATORS CERTIFIED IN THE CATEGORY 1.1 - AGRICULTURE - FIELD AND VEGETABLE CROP PEST CONTROL OR PERSONS UNDER THEIR DIRECT SUPERVISION.

SUPPLEMENTAL LABELING AND USE DIRECTIONS FOR THE EMERGENCY USE OF GOAL 1.6E HERBICIDE, EPA REG. NO. 707-174 FOR WEED CONTROL IN HORSERADISH IN WISCONSIN. CONSULT THE PRODUCT LABEL FOR ADDITIONAL REQUIREMENTS, RESTRICTIONS AND PRECAUTIONS.

THIS LABEL IS VALID ONLY DURING THE 1986 GROWING SEASON UNDER AN EPA EMERGENCY EXEMPTION ISSUED PURSUANT TO SECTION 18 OF THE FEDERAL INSECTICIDE, FUNGICIDE AND RODENTICIDE ACT, AS AMENDED.

USE OF THIS PRODUCT IN A MANNER INCONSISTENT WITH ITS LABELING IS A VIOLATION OF STATE AND FEDERAL LAWS. USE OF THIS PRODUCT FOR CONTROL OF WEEDS IN HORSERADISH WITHOUT THE SUPPLEMENTAL LABELING IN THE POSSESSION OF THE USER IS A VIOLATION OF THE LAW. USE OF THIS PRODUCT FOR THE CONTROL OF WEEDS IN HORSERADISH IN A MANNER OTHER THAN APPROVED UNDER THE EMERGENCY EXEMPTION IS CONSIDERED A MISUSE AND THE USER IS SUBJECT TO CRIMINAL AND CIVIL PENALTIES AND REVOCATION OF THE APPLICATOR'S CERTIFICATION CREDENTIALS.

BEFORE APPLYING THIS PRODUCT FOR CONTROL OF WEEDS IN HORSERADISH UNDER THIS EMERGENCY EXEMPTION CONTACT DR. HERBERT J. HOPEN DEPARTMENT OF HORTICULTURE, UW-MADISON, MADISON, WI 53706 (608-262-3988) OR HIS DESIGNEE FOR REPORTING REQUIREMENTS NECESSARY TO COMPLY WITH THE TERMS OF THE EXEMPTION. AT THE END OF THE GROWING SEASON, REPORTING OF THE NUMBER OF ACRES TREATED AND THE APPLICATION RATE IS REQUIRED.

GENERAL INFORMATION

GOAL 1.6E is a selective herbicide recommended for preemergence application to horseradish for control of certain broadleaf weeds. Initial spray applications should be made preemergence to horseradish. It may be desirable to cultivate immediately prior to application to remove germinated weeds and to cover emerging horseradish.

DOSAGE - HORSERADISH

Apply 2.5 pints of GOAL 1.6E herbicide (0.5 pounds active ingredient) per acre preemergence to horseradish.

TIMING AND METHOD OF APPLICATION - HORSERADISH

For best preemergence control of susceptible weeds, apply GOAL 1.6E just prior to emergence of horseradish.

GOAL 1.6E should be thoroughly mixed with clean water, at recommended concentrations, and applied in a minimum of 40 gallons of water per acre. Use conventional ground spray equipment with flat fan spray nozzles, at 20 to 40 psi. Accurately calibrate spray equipment prior to each use. Avoid drift to all other crops

and non-target areas. Thoroughly flush the spray equipment (tank, hose, pump, boom) with water before and after each use. Residual GOAL 1.6E remaining in spray equipment may damage other crops.

#### CULTURAL CONSIDERATIONS

In order to provide maximum preemergence weed control, the soil surface should be smooth and free of excessive trash (clippings, dead weeds, etc.). Rain or irrigation is not necessary immediately following application; however, preemergence weed control is best when application is followed within two weeks by rainfall.

Cultural practices which result in redistribution or disturbances of the soil surface after spraying will destroy the herbicidal effectiveness of the treatment. Cultivations that mix untreated soil in treated areas will also reduce the effectiveness of the treatment. The best results from GOAL 1.6E are from applications on established beds which are left undisturbed during the time period for which weed control is desired.

#### WEEDS CONTROLLED - HORSERADISH

GOAL 1.6E will provide preemergence control of the following weeds when applied at the recommended dosage.

Common lambsquarters	<u>Chenopodium album</u>
Common purslane	<u>Portulaca oleracea</u>
Pennsylvania smartweed	<u>Polygonum pensylvanica</u>
Redroot pigweed	<u>Amaranthus retroflexus</u>
Shepherdspurse	<u>Capsella bursa-pastoris</u>

#### USE RESTRICTIONS - HORSERADISH

- Do not apply more than 0.5 lb. active (2.5 pints) per acre of Goal 1.6E during one use season.
- Do not apply GOAL 1.6E within 60 days of harvest.
- Read and observe all label directions before using.
- Do not mix GOAL 1.6E with oils, surfactants, liquid fertilizers, or other pesticides.
- Do not contaminate irrigation water or water used for domestic purposes.
- Do not apply GOAL 1.6E when weather conditions favor drift. Avoid drift to all non-target areas. GOAL 1.6E herbicide is phytotoxic to plant foliage.
- Do not use any plants treated with GOAL 1.6E for feed or forage.
- Do not feed or graze animals on any areas treated with GOAL 1.6E herbicide.
- GOAL 1.6E should be applied only by ground application equipment.
- Thoroughly flush spray tank with water before and after each use. Residual Goal 1.6E herbicide remaining in tank mix may damage other crops.
- Use GOAL 1.6E herbicide only for recommended purposes and at recommended rates.
- Do not rotate any crops other than cotton, onions, soybeans, or spearmint/peppermint within a 10-month period after treatment.
- Do not treat ditchbanks or waterways with Goal 1.6E herbicide.

CONTACT THE PESTICIDE CONTROL SECTION, DATCP, P.O. BOX 8911, MADISON, WISCONSIN 53708 (608/266-2295) FOR ADDITIONAL INFORMATION.

3. Description of proposed use:

(i) Sites of expected treatment and acreage:

Area to be treated will not exceed 575 acres. It is expected that Goal will be used on most of this acreage. The primary area of production is in the northwest part of the state in Eau Claire County.

(ii) Method and rate of application:

Details of program state will implement. See proposed label (2.(ii)) for emergency exemption use directions and program implementation for Goal 1.6E use on horseradish in Wisconsin.

(iii) Restrictions and requirements of the proposed use:

See proposed label (2.(ii)) for applicable restrictions including qualification of applicators.

4. Availability of alternate controls:

Cultivation - Weed control in horseradish fields in Wisconsin is mainly limited to mechanical means. The rising costs of fuel and labor in the last eight years have made this practice increasingly impractical. Presently fields are cultivated eleven times a season for between the row weeds and handweeded at least once for in row weeds. Cultivation at \$4.50/A/operation costs the grower \$49.50/A/season and one handweeding operation at the \$3.35 minimum wage costs him another \$18.64/A for a total of \$64.14/A/season.

(i) Listing of pesticides currently registered:

Roundup - Glyphosate is registered for use before crop emergence. Although glyphosate can be used as a "clean-up" herbicide before planting, the emergence of weeds throughout the growing season seriously effects production. This continuing weed pressure must be countered with mechanical cultivation or herbicide treatment.

Dacthal - DCPA is registered for preemergence application at planting. Dacthal is not as effective as Goal on the higher organic soils on which Wisconsin's crop is grown, does not provide long season control, and controls primarily annual grass weeds. The use of Goal would broaden the weeds controlled and eliminate many cultivations.

The information on the pesticides listed above was provided by Professor Herbert J. Hopen, Horticulturist of the University of Wisconsin-Madison (see data in Appendix i).

5. Effectiveness of the proposed use:

The herbicide Goal 1.6E is being requested for section 18 registration on horseradish for preemergence use for control of annual broadleaf weeds. Evidence of the efficacy of such a treatment under Wisconsin and Illinois conditions is presented in Appendix i.

6. Discussion of residues for food uses:

The Rohm and Haas Company is cooperative with the IR-4 committee on minor crops registration. Residue samples were collected in 1984 in Illinois, and it is anticipated additional samples will be needed from Wisconsin in 1986.

7. Discussion of risk information:

No potential unreasonable risks to human health, endangered or threatened species, beneficial organisms and the environment are expected from using oxyfluorfen on horseradish.

8. Coordination with other affected state or federal agencies:

The Wisconsin Department of Natural Resources Bureau of Endangered Resources and Dr. Scott Craven, University of Wisconsin Extension Wildlife Ecologist, have been advised of the proposed exemption. No comments on the proposal were received from Dr. Craven or the WDNR.

9. Notification of registrant or basic manufacturer:

Dr. Herbert J. Hopen, University of Wisconsin-Madison Horticulturist, has supplied the manufacturer, Rohm and Haas Company, with a copy of this Section 18 request.

(i) Progress towards registration:

The Rohm and Haas Company is cooperating with the IR-4 Committee on the registration of oxyfluorfen for horseradish. Residue samples were collected in 1984 in Illinois, and it is anticipated additional samples will be needed from Wisconsin in 1986.

10. Description of the proposed enforcement/information program:

Dr. Herbert J. Hopen, Horticulturist with the University of Wisconsin-Madison, will administer the application program to ensure proper use of the pesticide and accurate reporting of pesticide use information.

Data on applications of oxyfluorfen on horseradish will be made available to the Department for pesticide use monitoring. A final report summarizing all treatments will be submitted to EPA after the close of the growing season.

The Department's field enforcement staff will, as appropriate, monitor pesticide sales, make pesticide use observations, and respond to misuse complaints.

11. Repeat uses:

It is hoped that the registration of GOAL 1.6E for horseradish will move forward during 1986. This application requests a specific exemption for one application during the 1986 growing season.

12. Information included in the appendices:

- (i) Research data from trials conducted in the North Central Region.
- (ii) Technical data relating to oxyfluorfen.
- (iii) GOAL 1.6E label information for other crops.

B. Information required for a specific exemption.

1. Pest or pest complex:

Goal 1.6E is a selective herbicide recommended as a preemergence surface-applied treatment for control of most annual broadleaf weeds in horseradish. The major pests include common lambsquarters (Chenopodium album), redroot pigweed (Amaranthus retroflexus), common ragweed (Ambrosia artemisiifolia), Pennsylvania smartweed (Polygonum pennsylvanicum), ladythumb smartweed (Polygonum persicaria), and common purslane (Portulaca oleracea).

2. Discussion of the events which brought about the emergency condition:

At present, there are no registered herbicides for horseradish which provide effective broadleaf weed control during the growing season. Weed control after planting depends entirely on cultivation for between row weeds and hand weeding for escapes and in row weeds. The crop is cultivated an average of eleven times a year. This is an excessively expensive practice (including fuel, machinery, and labor costs). A 0.5 lb.ai/A Goal treatment costing approximately \$25 would be cost effective and improve weed control. Research on the efficacy of Goal for weed control in horseradish has been conducted at the University of Wisconsin-Madison and University of Illinois at Urbana-Champaign. Data from these studies is included in Appendix i.

The emergency exists due to: (1) lack of a broadleaf herbicide effective during the growing season for the crop, (2) heavy weed pressure (evidenced by the number of cultivations needed for adequate control), and (3) continued rising costs of mechanical control (i.e. fuel, labor, and machinery).

3. Risks to endangered species, beneficial organisms or the environment:

See discussion in Item A.7.

4. Economic cost benefit and loss assessment.

(i) Average cost of production over the last 4 years: \$1,869.25 per acre.

(ii) Average crop yield over the last 4 years: 2.7 tons per acre.

(iii) Prices received for horseradish over the last 4 years: Price received over the last 4 years average \$1150/ton with anticipated price this year of \$700/ton.

(iv) Pesticides used and percent control obtained over the last 4 years: A small amount of Dacthal is used because of the limited spectrum of weed control. It is anticipated that a 0.5 lb.ai/A rate of Goal would give an 80 - 90% weed control rating, depending on the weed species present. This application of Goal at present costs could immediately save approximately \$24,808 based on 575 acres of horseradish planted. Data on the efficacy of such an oxyfluorfen treatment for weed control in horseradish is presented in Appendix i.

(v) Estimate of all of the above for the upcoming year: It is estimated that the above will not change significantly this year as compared to the last 4 years.